

REMARKS

I. STATUS OF THE CLAIMS

Claims 30-58 are pending in this application. Claims 30-39 have been withdrawn in view of the Examiner's June 26, 2003 Restriction Requirement. No claim has been amended herein. Applicants respectfully acknowledge that the Examiner has indicated that claims 45-47 and 57 would be allowable if rewritten in independent form including all the limitations of the base claim.

II. REJECTIONS UNDER 35 U.S.C. § 103

To establish a *prima facie* case of obviousness under 35 U.S.C. § 103, the Office bears the burden of establishing each of three requirements. First, the references must teach or suggest each and every element and limitation recited in the claims. See M.P.E.P. § 2143.03. Second, the Office must show that some suggestion or motivation exists, either in the references themselves, or in the knowledge generally available to one of ordinary skill in the art, to modify the references to achieve the presently claimed invention. See M.P.E.P. § 2143.01. Third, the Office must establish a reasonable expectation of success for the proposed combination. See M.P.E.P. § 2143.02. Each of these requirements must "be found in the prior art, and not be based on applicant's disclosure." M.P.E.P. § 2143. Moreover, deficiencies in the references cannot be cured by appealing to "common sense" and "basic knowledge" without any evidentiary support. In re Zurko, 258 F.3d 1379 (Fed. Cir. 2001).

A. Regarding claims 40, 44, 49, 50, 53-56, and 58

The Examiner rejected claims 40, 44, 49, 50, 53-56, and 58 under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 5,440,659 ("Bergano et al.") in view of U.S. Patent No. 5,649,043 ("Adams et al.") for the reasons set forth in pages 2-4 of the Office Action. Applicants respectfully traverse this rejection for at least the reasons presented below.

As admitted by the Examiner, Bergano et al. does not disclose that the optical fiber is arranged along an open helix trajectory, which is required by all pending claims. Office Action at 2. Rather, Bergano et al.'s fibers are each arranged in a closed helix trajectory. *Id.* Accordingly, the Examiner relies upon Adams et al. to teach the use of a closed helix trajectory. *Id.* at 3.

The Examiner alleges that it would have been obvious to one of ordinary skill in the art to wind Bergano et al.'s optical fibers in an open helix trajectory, as taught in Adams et al. "in the absence of a showing of criticality or unexpected results obtained." *Id.* According to the Examiner, winding an optical fiber in an open or closed helix trajectory are recognized as functional equivalents and selection is based upon preference. *Id.* Applicants respectfully disagree.

Bergano et al. discloses a method to reduce polarization mode dispersion (PMD) by inducing strain or stress to an optical fiber in a controlled manner. Improved PMD performance is achieved by uniformly twisting the optical fibers as they are arranged in the form of a "closed" spiral as a cable is being formed. Col. 1, lines 57-64. According to Bergano et al., PMD is higher in optical fibers in a relaxed condition as compared to

when it is under a certain amount of stress or strain, because “there is less mode coupling of the orthogonal modes that results from random localized birefringence.” Col 1., lines 40-44, emphasis added. The advantages of reduced PMD, as reported by Bergano et al., are found from the induced stress and strain that is due, in part, to the selection of a closed helix trajectory. Col. 3, lines 29-37.

On the other hand, Adams et al. teaches a high density optical fiber cable that protects the fibers from stress and strain caused by bending, tensile stress and compressive forces. Col. 2, lines 1-7. In stark contrast to Bergano et al., Adams et al. seeks to reduce stress and strain in the optical fibers. According to Adams et al., the optical fiber containing tubes may be positioned parallel to one another in an extended axial direction of the cable, or alternatively, the tubes may be stranded about the central strength member in a helical or alternating helical (SZ) pattern. Col. 2, lines 46-50. Applicants submit that since reducing PMD is not an objective of the invention taught in Adams et al., Adams et al. is indifferent with regard to whether the optical fibers were arranged parallel to each other along the axial direction, in a open spiral trajectory or in a closed spiral trajectory.

It is well established that the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the **desirability** of the combination/modification. M.P.E.P. § 2143.01. Furthermore, if the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. M.P.E.P. § 2143.01. Accordingly,

Applicants submit there cannot be any motivation to modify Bergano et al. to have a closed helix trajectory.

First, it is well-established that “[t]he fact that the claimed invention is within the capabilities of one of ordinary skill in the art is not sufficient by itself to establish a *prima facie* case of obviousness.” M.P.E.P. § 2143. Hence, the Examiner must offer a factually supported reason known in the art, to apply the limitations recited in Applicants’ claims 50 and 53-58. In re Zurko, 59 U.S.P.Q.2d 1693, 1697 (Fed. Cir. 2001) (“With respect to core factual findings in a determination of patentability, . . . the Board cannot simply reach conclusions based on its own understanding or expertise . . . Rather, the Board must point to some concrete evidence in the record in support of these findings.”) It is simply not enough for the Examiner to provide an opinion. *Id.* Applicants submit that the Examiner’s cursory statement of obviousness is insufficient.

Second, the fact that Adams et al. suggests that open and closed helix trajectories are interchangeable is not sufficient. The Examiner offers no basis for a person of ordinary skill in the art to make the suggested modification to Bergano et al. There is no indication of why the modification is ***desirable***, as required by M.P.E.P. §2143.01. The Examiner’s argument is merely an “obvious to try” argument, which is expressly disavowed by the M.P.E.P.

Third, the Examiner’s argument that the open and closed helix trajectories are allegedly “functionally equivalent” does not justify an obviousness rejection under the present facts. See M.P.E.P. § 2144.06. While in Adams et al. the two methods may have been considered interchangeable, that fact does not translate to “functional

equivalence" in Bergano et al.'s cables. Specifically, Bergano et al. teaches that its method of inducing stresses and strain, including the use of a closed helix trajectory was necessary to obtain the reduced PMD advantage. Adams et al. was not concerned with PMD but, rather, was concerned with reducing stress and strain, and, thus, selection of helix or even no helix was irrelevant to Adams et al. Open and closed helix trajectories may be "functionally equivalent" under certain circumstances, but according to Bergano et al., not under all circumstances.

Fourth, Applicants submit that the Examiner's proposed modification renders Bergano et al.'s invention unsatisfactory for its intended use and, thus, there is no motivation. Bergano et al. teaches that in order to achieve reduction in PMD, in addition to locally twisting the optical fibers, it is also required to arrange the optical wires in a closed helix pattern. Thus, to a person of ordinary skill in the art, a closed helix trajectory is an essential aspect of Bergano et al.'s invention. Not only does Bergano et al. not suggest arranging the optical fibers in a open helix trajectory, it suggests that if the optical fibers in Bergano et al. were so arranged, then such a modification would render Bergano et al. unsatisfactory for its intended purpose.

In addition, Bergano et al. teaches maintaining the twist-induced strain on the optical fibers by "permanently fixes the twisted fibers to the thermoplastic material to prevent the optical fibers from untwisting." Col. 7, lines 20-23. In contrast, Adams et al. emphasizes protecting the fibers from stress and strain. Col 2, lines 1-3. For example, the individual fibers, according to Adams et al., "may be loosely received in the tubes where the length of the optical fibers may be greater than the length of the

tubes.” Col. 2, lines 41-43. Thus, a person of ordinary skill in the art would not be motivated to make the suggested modification. Moreover, if the optical fibers in Bergano et al. were so arranged loosely, as taught in Adams et al., then such modification would again render the teaching of Bergano et. al. unsatisfactory for its intended purpose. According to M.P.E.P. §2143.01, “[i]f the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.”

Fifth, even assuming that that the combination is deemed “satisfactory,” the resultant modification does not render Applicants’ claims obvious. For example, since Bergano et al. suggests that the introduction of an open helix trajectory would be contrary to the goal of reducing PMD, Applicants submit that the proposed modification would not meet the present PMD claim limitations, either expressly or inherently.

Therefore, a proper suggestion or motivation to modify these references has not been established. For at least these reasons, Applicants submit that the rejections of claims 40, 44, 49, 50, 53-56, and 58 are improper and should be withdrawn.

Further with respect to claims 50, 53-56 and 58, Applicants submit that Bergano et al. does not teach the limitations of claims 50, 53-56 and 58. The Examiner asserts that a motivation exists to modify Bergano et al. to add these various limitations because these claims fall within the scope of customary practice of persons with ordinary skill in the art. Office Action at 3-4. In addition, the Examiner asserts that it is obvious to one of ordinary skill in the art to achieve the claimed dimensions as a matter

optimizing such parameters through routine experimentation. Office Action at 4.

However, this argument is legally and factually deficient.

As noted above, it is well-established that “[t]he fact that the claimed invention is within the capabilities of one of ordinary skill in the art is not sufficient by itself to establish a *prima facie* case of obviousness.” M.P.E.P. § 2143. Hence, the Examiner must offer a factually supported reason known in the art, to apply the limitations recited in Applicants’ claims 50 and 53-58. In re Zurko, 59 U.S.P.Q.2d at 1697.

The M.P.E.P. further explains that before an Examiner can make such an argument regarding routine experimentation, the Examiner must show that the prior art expressly recognizes that each variable, such as thickness, diameter, radius, etc., is a result-effective variable, which achieves a recognized result. M.P.E.P. § 2144.05 (II)(B). If the art does not recognize the effect of varying that parameter, then there can be no determination of optimum or workable ranges, and, thus, no obviousness argument. *Id.* Here, the Examiner has made no such determination because the cited art does not recognize the relationship. Moreover, Applicants’ specification is unavailable for that purpose.

For at least these additional reasons, Applicants submit that the rejection of claims 50, 53-56 and 58 is improper and should be withdrawn.

B. Regarding claims 41 and 42

The Examiner has rejected claims 41 and 42 under 35 U.S.C. § 103(a) as being unpatentable over Bergano et al. and Adams et al., as applied to claim 40, in view of U.S. Patent No. 6,035,086 (“Norman et al.”), for the reasons given at pages 4 and 5 of

the Office Action. Applicants respectfully traverse this rejection for at least the reasons presented below.

As discussed above, Bergano et al. fails to teach or suggest an optical fiber "being arranged along an open helix trajectory" as recited in claim 40, and Adams et al. is insufficient to correct this deficiency. Moreover, Applicants submit that the Examiner has not offered any evidence that would provide a motivation to modify Bergano et al.'s teaching of a closed helix trajectory in view of Norman et al. It is obligatory for the Examiner to cite evidence that would suggest to a person of ordinary skill in the art that there is a desirable reason, *i.e.*, a motivation, to replace Bergano et al.'s open helix trajectory with Applicants' closed helix trajectory.

For at least this reason, Applicants submit that the rejection of claims 41 and 42 is improper and should be withdrawn.

C. Regarding claims 43 and 48

The Examiner rejected claims 43 and 48 under 35 U.S.C. § 103(a) as unpatentable over Bergano et al. and Adams et al., as applied to claim 40, in view of U.S. Patent No. 5,418,881 ("Hart et al.") for the reasons given at pages 5-6 of the Office Action. Applicants respectfully traverse this rejection for at least the reasons presented below.

As discussed above, Bergano et al. fails to teach or suggest an optical fiber "being arranged along an open helix trajectory" as recited in claim 40, and Adams et al. is insufficient to correct this deficiency. Moreover, Applicants submit that the Examiner has not offered any evidence that would provide a motivation to modify Bergano et al.'s

teaching of a closed helix trajectory in view of Hart et al. It is obligatory for the Examiner to cite evidence that would suggest to a person of ordinary skill in the art that there is a desirable reason, *i.e.*, a motivation, to replace Bergano et al.'s close helix trajectory with Applicants' open helix trajectory.

First, Bergano et al. teaches uniform twisting of optical fibers in that twist rate is constant over the entire length of fibers. Col. 7, lines 15-17, emphasis added. Uniform twisting, according to Bergano et al., reduces twist-induced strain and promotes optimum PMD reduction. Col. 1, lines 63-64. On the other hand, Hart et al. teaches spinning optical fibers in varying spatial frequencies to produce efficient coupling. Col. 3, lines 30-34.

According to the M.P.E.P., if a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. M.P.E.P. § 2143.01. Here, while Bergano et al. clearly emphasizes twisting the optical fibers uniformity along its entire length, Hart et al. teaches inconsistent spinning frequency along the fiber. Therefore, combining the two references would render Bergano et al. inoperable for its intended purpose.

Second, combining Bergano et al. and Hart et al. will not meet all aspects of the claimed invention. Bergano et al. teaches the twisting of the optical fibers "in a controlled manner as the cable is being formed." Col. 1, line 60 (emphasis added). On the other hand, Hart et al. discloses the application of a torque to the optical fiber "during drawing of the fiber." See Abstract (emphasis added). Specifically, Hart et al.

teaches applying torque to the fiber downstream from a curing station but prior to the take-up spool. Col. 4, lines 21-24. Therefore, while Bergano et al. discloses twisting an already-fabricated fiber, Hart et al. teaches twisting the optical fiber as a part of the fiber-fabrication process.

Since an optical fiber of Hart et al. already possesses zero net strain before inclusion in a cable, one of ordinary skill in the art would understand that the application of additional twisting during formation of the cable, as taught in Bergano et al., should result in a net torsion strain greater than zero. Therefore, combining Bergano et al. with Hart et al. would not arrive at an optical fiber with zero mean torsion, as recited in the claims 43 and 48.

For at least these reasons, a proper suggestion or motivation to modify these references has not been established. Therefore, Applicants submit that the rejections of claim 43 and 48 are improper and should be withdrawn.

D. Regarding claims 51 and 52

The Examiner rejected claims 51 and 52 under 35 U.S.C. § 103(a) as unpatentable over Bergano et al. and Adams et al., as applied to claim 40, in view of U.S. Patent No. 6,363,192 ("Spooner et al.") for the reasons given at pages 6-7 of the Office Action. Applicants respectfully traverse this rejection for at least the reasons presented below.

As discussed above, Bergano et al. fails to teach or suggest at least an optical fiber "being arranged along an open helix trajectory" as recited in claim 40, and Adams et al. is insufficient to correct this deficiency. Moreover, Applicants submit that the

Examiner has not offered any evidence that would provide a motivation to modify Bergano et al.'s teaching of a closed helix trajectory in view of Spooner et al. It is obligatory for the Examiner to cite evidence that would suggest to a person of ordinary skill in the art that there is a desirable reason, i.e., a motivation, to replace Bergano et al.'s close helix trajectory with Applicants' open helix trajectory.

For at least this reason, Applicants submit that the rejection of claims 51 and 52 is improper and should be withdrawn.


III. CONCLUSION

In view of the foregoing remarks, Applicants respectfully request reconsideration and reexamination of this application and the timely allowance of the pending claims. Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account no. 06-0916.

Respectfully submitted,

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